Supporting Information for

Fluorescent Bioaerosol Particles Resulting from Human Occupancy With and Without Respirators

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Table S1. The average concentration of the fluorescent biological aerosol particles in ambient environment and human exhaled breath detected by the UV-APS; c1 represents the mean concentration of exhaled bioaerosols of 12 people; 12 people were divided into 3 groups, and each group was studied at different times. c0 was the mean concentration of environmental bioaerosols measured; data sets by the UV-APS were recorded every 1 minute.

N_{FP} (cm^{-3})			
Average of environmental bioaerosol concentration (c_0)	**Average of exhaled bioaerosols (c_1)**	**c_1/c_0**	**The average of c_1/c_0**
0.061499	0.077398	1.26	2.57±1.46
	0.096798	1.57	
	0.311994	5.07	
	0.130797	2.13	
0.027499	0.039999	1.45	
	0.053199	1.93	
	0.062999	2.29	
	0.045999	1.67	
0.111198	0.348993	3.14	
	0.123398	1.11	
	0.423591	3.81	
	0.597388	5.37	
0.066732	0.192713	2.57	

Table S2. The average concentration of the fluorescent biological aerosol particles in indoor air when there were no people or 5 people present in the controlled environment and the emission rate of bioaerosols released from humans; V represents the space of the controlled environment: 27 m^3; q represents the number of people in the controlled environment; t represents the monitoring time: 30 minutes.

	N_{FP} (cm^{-3})			Percentage increase (%)	Emission rate of bioaerosols released from humans (10^6 particles $person^{-1}$ $hour^{-1}$)
Number of experiment	**Average bioaerosol concentration when no-person-in (c_0)**	**Average bioaerosol concentration when 5-persons-in for 30 min (c_1)**	**c_1-c_0**	**(c_1-c_0)/c_0*100**	**(c_1-c_0)*V/q/t**
#1	0.15450	0.24595	0.0915	59.2	0.988
#2*	0.15986	0.70962	0.5498	343.9(Outlier)	5.937(Outlier)
#3	0.04387	0.10906	0.0652	148.6	0.704
#4	0.06610	0.14153	0.0754	114.1	0.815
#5**	0.11400	0.14328	0.0293	25.7	0.633
Average of 1, 3 and 4	0.0881±0.058	0.1655±0.0715	0.07736±0.0133	107.3±45.1	0.8357±0.1431

Note: "*" indicates that the percentage increase of N_{FP} was an outlier, so averages were calculated using the experiments: #1, #3 and #4 only; "" indicates that the fifth experiment only monitored 15 minutes.**

Table S3. The percentage increase of the controlled environmental fluorescent biological aerosol particles under different circumstances; the percentage increase was calculated by using mean value of bioaerosol concentration under different situations.

Number of experiment	Percentage increase when 5 persons in compared to "no-person-1" (%)	Percentage increase when 5 persons in with N95 respirators compared to "no-person-2" (%)	Percentage increase when 5 persons in with "Doctor masks" compared to "no-person-3" (%)
1	59	73	NA
2	344(Outlier)*	101	14
3	149	70	48
4	114	NA	NA
average	107±45	81±17	31±24

***The outlier (344) was not included in the average calculation;** "NA" in the table indicates that relevant data were not obtained.

Table S4. The percentage increase of the particle number concentration of particulate matters under different circumstances; the percentage increase was calculated by using mean values of aerosol particle concentrations under different situations (a negative value indicates a decline in the number concentration (>0.5 μm)).

Number of experiment	Percentage increase when 5 persons in compared to "no-person-1" (%)	Percentage increase when 5 persons in with N95 respirators compared to "no-person-2" (%)	Percentage increase when 5 persons in with "Doctor masks" compared to "no-person-3" (%)
#1	-31	10	NA
#2	-15	2	-15
#3	-42	9	-15
#4	-5	NA	NA
average	-23±16	7±4	-15

Note: "NA" in the table indicates that relevant data were not obtained.

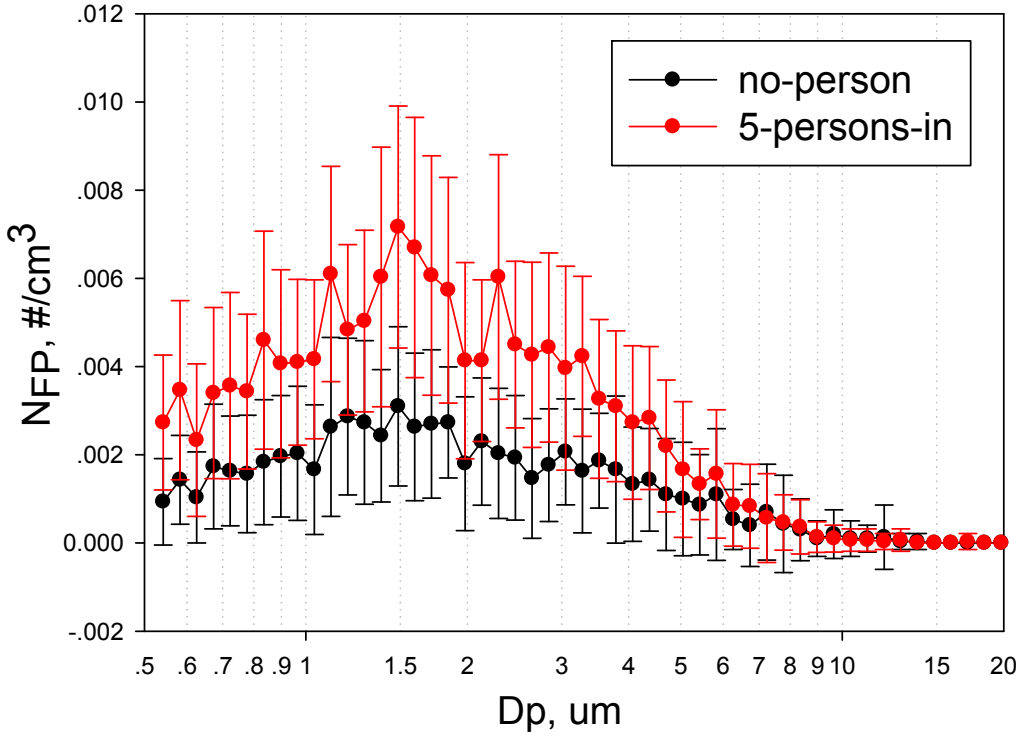

Fig. S1. The average size distribution of the fluorescent biological aerosol particles detected by the UV-APS when there are no people or 5 people in the controlled environment from the fourth experiments; D_p represents aerodynamic diameter, and N_{FP} represents the concentration of fluorescent biological aerosol particles; data points represent means and standard deviations of environmental bioaerosols, and data set was recorded every 1 minute.

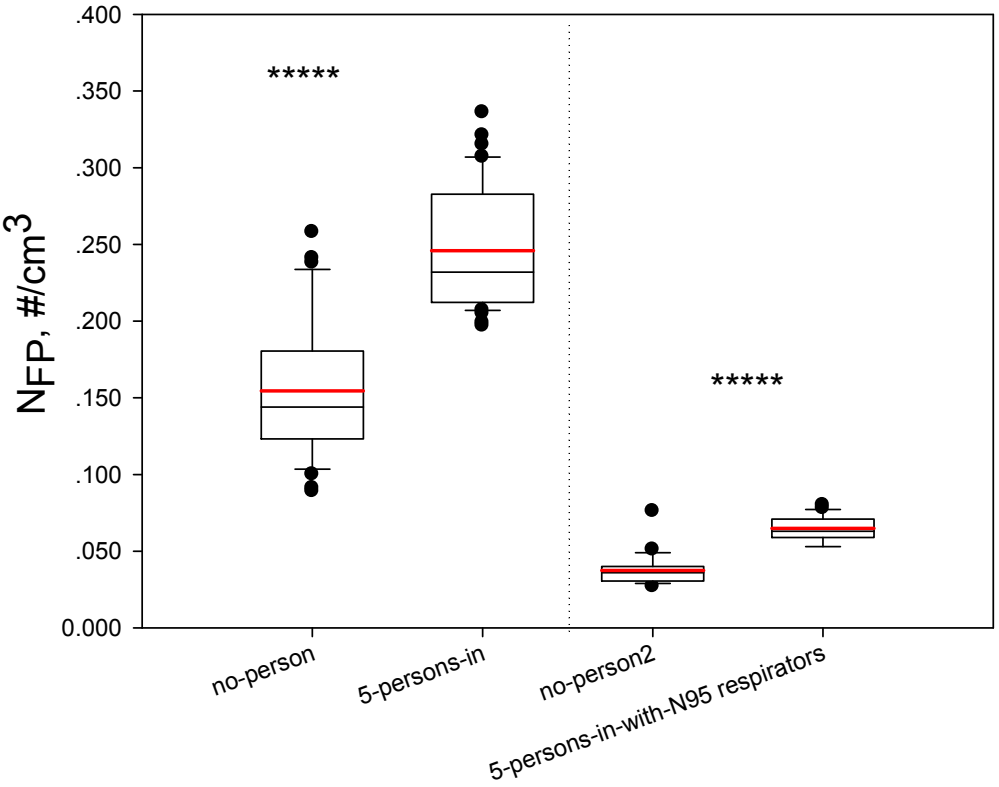

Fig. S2. The concentration levels (Boxplots) of the fluorescent biological aerosol particles in the indoor air in the controlled environment under different situations in the first experiment; the monitoring time was 30 minutes for each situation. D_p represents aerodynamic diameter, and N_{FP} represents the concentration of fluorescent biological aerosol particles in the indoor air in the controlled environment; data set was recorded every 1 minute. Data points represent concentration values of every 1 minute data. ***** indicates a statistically significant difference.

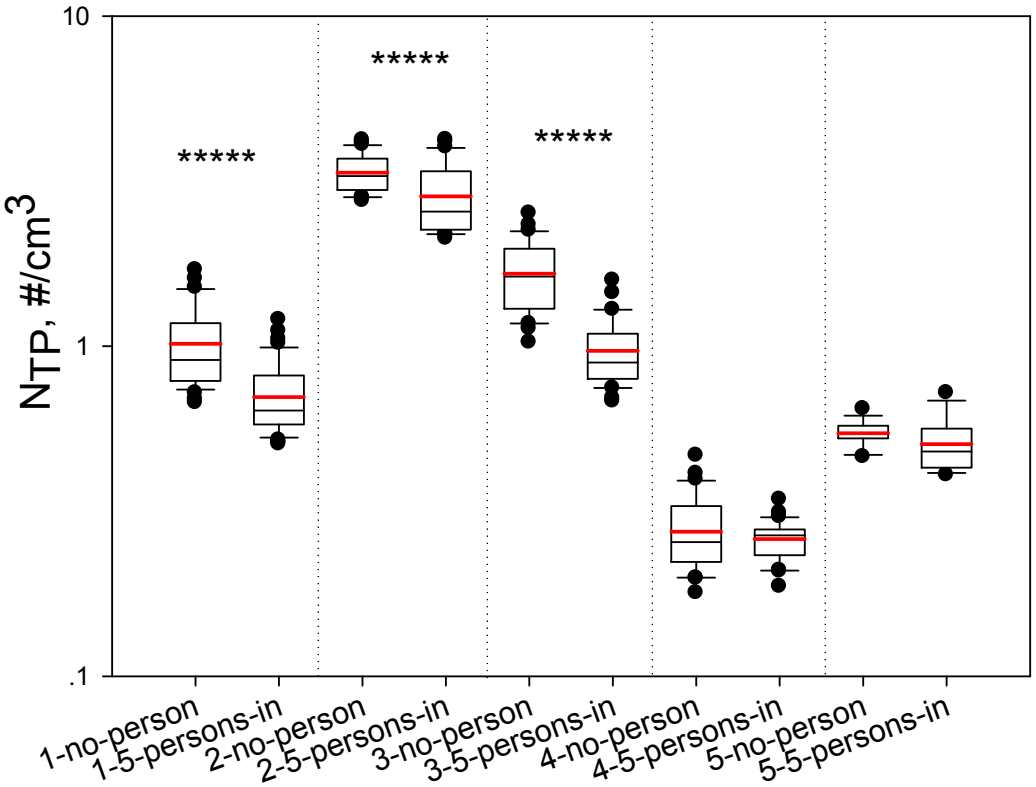

Fig. S3. The particle (>= 0.3 μm) number concentration levels (Boxplots) of the particulate matters when there are no people or 5 people in the controlled environment; N_{TP} represents the concentration of aerosol particles and the data point represents particles' concentration value of every 1 minute in indoor air. Different from the four experiments which monitored 30 minutes, the monitoring time of the fifth experiment (5-no-person) was only 15 minutes. ***** indicates a statistically significant difference.